Big & Little Myers Lake's Management Recommendations 2009

Current Conditions in the Lake

Aquatic Vegetation

The Big & Little Myers Lake's submersed plant community was once dominated by Eurasian watermilfoil. The lake also has a number of native species, including Chara, Wild celery, and pondweeds. While many native plants are present and desirable at low levels, most have been managed through treatments and/or partial harvesting during the 2008 season. Budgets were an extreme limitation in 2008 and recent years. Based on modification in the Special Assessment District, funding has been increased for the 2009 and following seasons. These changes will allow for increase management efforts and will improve overall quality of living on Big & Little Myers Lake's. However, plant communities change thru out each season and from year to year. Therefore an intergraded approach should be used in order to achieve a well balanced aquatic plant community.

The macrophyte community of Big & Little Myers Lake's is reasonably diverse (Table 1). Of the plants listed in Table 1, all but Eurasian watermilfoil, Curlyleaf pondweed are native North American species. Eurasian watermilfoil is a non-indigenous aquatic nuisance species, i.e., plants from other places, which cause considerably more problems than most native species. Eurasian watermilfoil can attain nuisance levels of growth at almost any time of year

Table 1 Plant Species Found In Big & Little Myers Lake's

Common Name	Scientific Name
Submersed Plants	
Eurasian watermilfoil	*Myriophyllum spicatum* L.
Curlyleaf pondweed	*Potamogeton crispus*
Sago Pondweed	*Potamogeton pectinatus*
Wild celery	*Vallisneria americana*
Muskgrass	*Chara sp*
Variable Pondweed	*Potamogeton spp.*
Robbins Pondweed	*Potamogeton robbinsii*
Illinois Pondweed	*Potamogeton illinoensis*
Water stargrass	*Heteranthera dubia*
Coontail	*Ceratophyllum demersum*
Elodea	*Elodea canadensis*
Naiad	*Najas spp.*
Floating-Leaved Plants	
Water lily	*Nymphaea tuberosa* Paine
Spatterdock	*Nuphar sp.*
Watershield	*Brasenia schreberi*
Emergent Plants	
Cattail	*Typha latifolia* L.
Pickerelweed	*Pontederia cordata*
Purple Loosestrife	*Lythrum Salicaria*

The native plant species in Big & Little Myers Lake's benefit the lake, performing such functions as stabilizing sediments and providing habitat for fish and other aquatic organisms. In general, native species cause substantially fewer problems than the exotic plant species.

Management Strategies for Big & Little Myers Lake's

Management Goals

- The primary goal of aquatic plant management should be to control exotic aquatic plants. The exotic plant species, Eurasian watermilfoil, should be controlled throughout Big & Little Myers Lake's. The abundance of these species should be reduced to the maximum extent possible, and efforts should be made to reduce their recovery after treatment.
- Species diversity and sufficient cover of native plants to provide fish habitat shall be maintained in the lake. Native plants should be managed to encourage the growth of plants that support the Big & Little Myers Lake's fishery (by creating structure and habitat) provided that they do not interfere with recreational uses of the lake (e.g., swimming, water skiing, boating, and sailing) in high-use areas. Where they must be managed, management

techniques that reduce the stature of plants without killing them (e.g., harvesting, contact herbicides) should be used whenever possible. Specific areas should be set aside where native plants will not be managed, to provide habitat for fish and other aquatic organisms. Muskgrass (*Chara*) should be allowed to grow throughout the lake, except where it grows so tall as to interfere with boating and swimming.

- The species Starry stonewort, if found, should be actively controlled and managed. Starry stonewort is in the same family as Muskgrass (Chara) but is considered to be an exotic invasive species. Starry stonewort, which looks very similar to the beneficial species Chara, is appearing in more and more lakes. Chara is a highly desired plant because it is typically low growing, keeps the water clear and can slow down the invasion of exotic weed species. Starry stonewort also forms dense mats, but unlike chara, it can grow from 5 to 7 feet tall. Starry stonewort can be very detrimental to a lake's ecosystem and has the ability to kill off native plants and have a negative impact on a lake's fisheries.
- The invasive terrestrial plants, Purple loosestrife and Phragmities should be controlled along the shoreline and adjacent wetlands where present. Both species are exotic and have the ability to displace beneficial native vegetation. Purple loosestrife grows 2 -4 feet tall and is a vibrant magenta color. It is very aggressive and can quickly become the dominant wetland vegetaion. Phragmites (common reed) is a wetland grass that ranges in height from 6 to 15 feet tall. "Phrag" quickly becomes the dominant feature in aquatic ecosystems, aggressively invading shorelines, wetlands, and ditches. This plant creates dense "strands" - walls of weeds crowding out beneficial native wetland vegetation and indigenous waterfowl habitats. Spreading by fragmentation and an extensive root system, Phragmites ultimately out-competes native plant life for sun, water and nutrients.
- Conditions in Big & Little Myers Lake's should not be allowed to deteriorate below present levels. Efforts to reduce nutrient and sediment loading should begin, with the realization that they will help prevent further deterioration but probably not improve water quality. Expansion of aquatic plant problems should trigger an adjustment in the aquatic vegetation management strategy. To support such responses, an annual record of vegetation, water quality and management should be maintained.

Strategies for Achieving Lake Management Goals

Aquatic Plant Management

Areas of the lake that support vegetation *will* grow plants, despite intense efforts to remove them. The goal of aquatic plant management is not to remove all vegetation, but to control the types of plants that grow in the lake and the height of plants, to minimize interference with human activities. In general, native plants interfere less with recreation and other human activities than exotic species. In addition, native vegetation provides important benefits to a lake, including stabilizing sediments, providing habitat for fish and other aquatic organisms, and slowing the spread of exotic plant species.

The non-native plant species, Eurasian watermilfoil, should be controlled wherever present, using selective methods that minimize damage to native aquatic vegetation. This exotic species concentrate its biomass at the water surface where it strongly interferes with boating, swimming and other human activities. This growth form also allows exotic plants to displace native plants and form a monospecific (i.e., single species) plant community, which provides lower quality habitat than that provided by a diverse community of native plants. Control of exotic plant species will minimize interference of plant growth with human activities and allow recovery of the native vegetation of the lake.

Aquatic herbicides currently represent the most reliable, effective means for controlling Eurasian watermilfoil. There are currently three systemic herbicides, 2,4-D (Navigate), Renovate and fluridone (Sonar), that can be used to achieve long-term, selective control of Eurasian watermilfoil. Systemic herbicides are capable of killing the entire plant. Several contact herbicides, including diquat (Reward) can also provide short-term control of Eurasian watermilfoil. These herbicides kill only the shoots of the plant, and plants regrow relatively rapidly from their unaffected belowground parts.

Harvesting of Eurasian watermilfoil is not recommended. This plant spreads by fragmentation and regrows significantly more rapidly than most native plant species; thus continued harvesting typically leads to nearly complete domination of the aquatic vegetation by Eurasian watermilfoil.

Native plants provide many important benefits to lakes, including stabilizing sediments and providing habitat for fish and other aquatic organisms. Many of the native species are difficult to control using herbicides, and the MI-DEQ is reluctant to issue permits for their control. If successful control of Eurasian watermilfoil results in an expansion of native plants to the point where control is required, harvesting would be the best control method. Unlike Eurasian watermilfoil, most native plants do not regrow rapidly after harvesting, and a single harvest is often sufficient to control them for the entire summer. Normally low-growing species, such as muskgrass (Chara) should not be controlled unless unusually fertile growing conditions allow them to grow tall in areas of high recreational use.

Monitoring

It is important to maintain a record of lake conditions and management activities. Vegetation surveys monitor types and locations of plants in the lake, providing information that is essential to the administration of efficient, cost-effective control measures. Vegetation surveys also document the success or failure of management actions and the amount of native vegetation being maintained in the lake. Water quality monitoring can identify trends in water quality before conditions deteriorate to the point where remediation is prohibitively expensive or impossible. Records of past conditions and management activities also help to keep management consistent despite changes in the membership of the Lake Board. Records should include (at a minimum):

- Temperature, dissolved oxygen and Secchi disk depth should be measured in the lake and canals. Temperature and dissolved oxygen profiles should be obtained in the deep hole, so as to monitor the timing and extent of oxygen depletion in the hypolimnion (i.e., bottom water).
- Total phosphorus and nitrates should be measured in the surface and bottom water at least two times per season (spring and late summer) to monitor nutrient accumulation in the hypolimnion.
- Lake vegetation should be surveyed and mapped each year (late-spring and/or late summer/early fall) to document the results of plant management efforts and provide information necessary for planning future management.

Nutrient Loading Abatement

Lakeshore property owners should be encouraged to use phosphorus-free fertilizers on lawns and other areas that drain into Big & Little Myers Lake's or the adjacent wetlands. Lakeshore residents should also be encouraged to manage their waterside landscapes according to the recommendations outlined in publications on this topic available from the MSU Extension.

It is also important to remember that rooted plants derive most of their key nutrients from the sediments; thus they respond slowly, if at all, to reductions in nutrient loading. In fact, if reductions in nutrient loading lead to improved water clarity, the growth of rooted plants will probably increase.

Prevention

Eurasian watermilfoil was almost certainly introduced to Big & Little Myers Lake's by plant fragments carried on boats and/or boat trailers. A variety of other troublesome exotic plants and animals could be introduced to Big & Little Myers Lake's this way. Preventing their inadvertent introduction to Big & Little Myers Lake's can significantly lower the cost of future lake management. Education can be an effective preventative measure. Newsletter articles should alert lake residents to the threat from exotic nuisance plants and animals. Warning signs should be erected at the boat launch that encourages boaters to clean boats and trailers when launching or removing watercraft from the lake.

Yearly Management Schedule

Future aquatic plant management programs should detect and treat any areas where Eurasian watermilfoil is found, control curly leaf pondweed and control any areas where native plants become sufficiently dense to interfere with recreation. Algae control will be required, probably to about the same extent as in the past.

The recommended management program for Big & Little Myers Lake's consists of:

- A spring vegetation survey (to evaluate conditions in the lake and direct management efforts)
- Early summer herbicide treatment (to control any Eurasian watermilfoil and/or curly leaf pondweed areas that are found)
- Algaecide treatments as needed
- Mid-summer herbicide treatment (to control any Eurasian watermilfoil, native plants or Eel grass)
- Harvesting of native plants in late summer, if needed
- Late summer herbicide treatment (to control any Eurasian watermilfoil areas that are found)
- Water quality evaluations should continue
- A fall vegetation survey